Amendments to the Claims

Please cancel claims 27 and 37, amend claims 22, 28, 29, 32 and 42-45, and add new claims 51-64 as follows:

1-21. (Cancelled)

22. (Currently Amended) A method for allocating bits to encode ~~each~~ a plurality of frames of an image sequence, each frame of said image sequence comprising a plurality of objects, said method comprising the steps of:

(a) determining a target frame bit rate, T_{frame}, for each of the frames in accordance with a quantizer scale for each object in the frame;

(b) allocating said target frame bit rate among the plurality of objects in accordance with the formula:

$$V_i = K_i \times T_{frame}$$

where V_i is a target object bit rate for each object, and K_i is proportional to an average pixel value for the object; ~~and~~

(c) generating the quantizer scale for each of said plurality of objects in accordance with said target object bit rate, wherein said quantizer scale provides coarser and/or fewer allowed quantization values for a high frequency subband of said image sequence than for a low frequency subband of said image sequence; and

(d) recursively adjusting the target frame bit rate for ~~each~~ subsequent frames in the sequence.

23. (Previously Presented) The method of claim 22, further comprising determining said target object bit rate for each of the plurality of objects in accordance with a mean absolute difference (MAD) of said object.

24. (Previously Presented) The method of claim 22, further comprising adjusting said target object bit rate in accordance with a measure of a first in-first out (FIFO) buffer fullness.

25. (Previously Presented) The method of claim 22, further comprising allocating said target object bit rate to code syntax information, motion information, and shape information of the object.

26. (Previously Presented) The method of claim 25, further comprising adjusting said target object bit rate allocation to said shape information of said object.

27. (Canceled)

28. (Currently Amended) The method of claim [[27]] 22, further comprising the step of:

(e) encoding said ~~at least one~~ plurality of objects with said quantizer scale.

29. (Currently Amended) Apparatus for encoding ~~each~~ frames of an image sequence, ~~said~~ each frame comprising a plurality of objects, said apparatus comprising:

a motion compensator for generating a predicted image of a current frame;

a transform module for applying a transformation to a difference signal between the current frame and said predicted image, where said transformation produces a plurality of coefficients;

a quantizer for quantizing said plurality of coefficients with at least one quantizer scale for each object in the frame; and

a controller for generating the at least one quantizer scale for each of said plurality of objects in accordance with a target object bit rate, wherein said quantizer scale(s) provide coarser and/or fewer allowed quantization values for a high frequency subband of said image sequence than for a low frequency subband of said image sequence, selectively adjusting said at least one quantizer scale for a the current frame in response to a said target object bit rate for each of the plurality of objects, and ~~for~~ determining said target object bit rate from a target frame bit rate, T_{frame}, in accordance with the formula:

$$V_i = K_i \times T_{frame}$$

where V_i is a target object bit rate for each object, and K_i is proportional to an average pixel value for the object.

30. (Previously Presented) The apparatus of claim 29, wherein said controller determines said target object bit rate for the plurality of objects in accordance with a mean absolute difference (MAD) of said object.

31. (Cancelled)

32. (Currently Amended) A computer-readable medium having stored thereon a plurality of instructions which, when executed by a processor, perform steps comprising:

(a) determining a target frame bit rate, T_{frame}, for ~~each~~ a frame in an image sequence in accordance with a quantizer scale for each object in the frame, wherein said each frame includes a plurality of objects; and

(b) allocating said target frame bit rate among the plurality of objects in accordance with the formula:

$$V_i = K_i \times T_{frame}$$

where V_i is a target object bit rate for each object, and K_i is proportional to an average pixel value for the object; ~~and~~

(c) generating the quantizer scale for each of said plurality of objects in accordance with said target object bit rate, wherein said quantizer scale provides coarser and/or fewer allowed quantization values for a high frequency subband of said image sequence than for a low frequency subband of said image sequence; and

(d) recursively adjusting the target frame bit rate for each frame in the sequence.

33. (Previously Presented) The computer-readable medium of claim 32, further comprising an instruction to determine said target object bit rate for each of the plurality of objects in accordance with a mean absolute difference (MAD) of said object.

34. (Previously Presented) The computer-readable medium of claim 32, further comprising an instruction to adjust said target object bit rate in accordance with a measure of a buffer fullness.

35. (Previously Presented) The computer-readable medium of claim 32, further comprising an instruction to allocate said target object bit rate to code syntax information, motion information, and shape information of the object.

36. (Previously Presented) The computer-readable medium of claim 35, further comprising an instruction to adjust said target object bit rate allocation to said shape information of said object.

37. (Canceled)

38. (Currently Amended) The computer-readable medium of claim [[37]] 32, further comprising an instruction to perform the step of:

(c) encoding said ~~at least one~~ plurality of objects with said quantizer scale.

39. (Previously Presented) The method of Claim 22, comprising determining said target frame bit rate from a remaining number of bits for the image sequence, a number of remaining frames in the image sequence, and/or a number of bits encoding a previous frame.

40. (Previously Presented) The method of Claim 22, further comprising adjusting said target object bit rate in accordance with a buffer fullness measure.

41. (Previously Presented) The method of Claim 22, wherein said target frame bit rate is recursively adjusted by a polynomial regression process.

42. (Currently Amended) The method of Claim 22, further comprising:

estimating a complexity of a type of picture;

deriving a predicted number of bits to code ~~the~~ each frame from the estimated picture complexity; and

calculating the quantizer scale for ~~the~~ each frame in part in accordance with the complexity measure.

43. (Currently Amended) The method of Claim 22, further comprising encoding each of the frames.

44. (Currently Amended) The method of Claim 22, further comprising selecting said target object bit rate for each of the plurality of objects in accordance with mean absolute differences (MAD) of said ~~at least one~~ plurality of objects.

45. (Currently Amended) The method of Claim 44, further comprising producing said MAD for each of the objects from a sum of absolute differences (SAD) of the pixels of the object divided by the number of pixels in the object.

46. (Previously Presented) The method of Claim 45, further comprising determining the absolute difference between pixel values in the original image and the corresponding pixel values in the predicted image for pixels in the object.

47. (Previously Presented) The method of Claim 22, further comprising determining whether said target object bit rate is sufficient to code syntax information, motion information and shape information for said object.

48. (Previously Presented) The method of Claim 47, further comprising incrementally or decrementally changing a number of bits allocated for shape coding.

49. (Previously Presented) The method of Claim 47, further comprising increasing the target object bit rate when it is smaller than that necessary to code syntax information, motion information and shape information for the object in the previous frame, or decreasing the target object bit rate when it is greater than that necessary to code syntax information, motion information and shape information for the object in the previous frame.

50. (Canceled)

51. (New) The method of Claim 22, wherein generating the quantizer scale comprises customizing a matrix of quantization values depending on characteristics of an intended display, a viewing distance and an amount of noise.

52. (New) The method of Claim 51, further comprising storing the customized quantization matrix as context with a compressed image sequence.

53. (New) The method of Claim 22, wherein the quantizer scale is further generated in accordance with a distortion measure that represents a mean absolute difference for a current object after performing motion compensation.

54. (New) The method of Claim 53, further comprising an instruction to compute the distortion measure by summing the differences between a current object and the same object in a previous frame from block to block and computing a mean absolute difference measure.

55. (New) The apparatus of Claim 29, wherein the quantizer scale comprises a matrix of quantization values that depend on characteristics of an intended display, a viewing distance and an amount of noise.

56. (New) The computer-readable medium of Claim 32, wherein generating the quantizer scale comprises customizing a matrix of quantization values depending on characteristics of an intended display, a viewing distance and an amount of noise.

57. (New) The computer-readable medium of Claim 36, further comprising an instruction to store the customized quantization matrix as context with a compressed image sequence.

58. (New) The computer-readable medium of Claim 32, further comprising an instruction to further generate the quantizer scale in accordance with a distortion measure that represents a mean absolute difference for a current object.

59. (New) The computer-readable medium of Claim 58, further comprising an instruction to compute the distortion measure by summing the differences between a current object and the same object in a previous frame from block to block and computing a mean absolute difference measure.

60. (New) The method of Claim 40, further comprising skipping a next frame without encoding the next frame when a buffer fullness plus an estimated target frame bit rate of the next frame is above 80% of a size of the buffer.

61. (New) The method of Claim 60, further comprising updating the buffer fullness by a channel output rate, after skipping the next frame.

62. (New) The apparatus of Claim 29, further comprising a buffer having a size and a fullness, wherein said controller skips a next frame without encoding the next frame when the buffer fullness plus an estimated target frame bit rate of the next frame is above 80% of the size of the buffer.

63. (New) The computer-readable medium of Claim 34, further comprising further comprising an instruction to skip a next frame without encoding the next frame when the buffer fullness plus an estimated target frame bit rate of the next frame is above 80% of a size of the buffer.

64. (New) The computer-readable medium of Claim 63, further comprising updating the buffer fullness by a channel output rate, after skipping the next frame.